Title: Mechanical Response of 3D Printed Composite Materials

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Abstract: 300 words

Nowadays, in order to overcome the limitations of the physical abilities, humans have tried their best to find external ways and use the object or power to enhance their strength of physical and endurance. Therefore, some auxiliary devices can able to bear structures and power systems similar to exoskeletons have emerged that provide additional energy to enhance the power of the body. The common exoskeleton devices developed on the market are worn on the human body and it has the problem that the weight of the auxiliary device. Therefore, the design of the structure, especially porous structure, is important since it is the efficiency way to achieve the lightweight propose. The porous structure is a three-dimensional structure formed by a large number of pores of the same shape. To compare with general continuous materials, the porous structure has the advantages of low relative density, high specific strength, good permeability, and etc. In this research, all of the samples were fabricated by Fused Deposition Modeling (FDM) method. The materials used in this study is the composite which combine nylon and carbon short fiber. The advantages of this composite materials are excellent tensile strength, corrosion resistance and fatigue resistance. However, the difference in scanning strategies during the manufacturing process would directly affect the mechanical properties of the structure. Hence, the relationship between the porosity structure design, scanning strategies, and the mechanical properties will be explored and discussed in details. Beside, the differences between the loading direction of the porous structure are also the emphasis in this research.



Biography:

Kuan-Yu,Huang, MS student, Department of Bioinformatics and Medical Engineering, Asia University, Taiwan. Her research topic is focused on mechanical response of 3D printed composite materials.

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